

## BACHELOR OF ENGINEERING TECHNOLOGY IN CHEMICAL ENGINEERING



01 JAN - 31 DEC 2024

### Bachelor of Engineering Technology in Chemical Engineering

**NQF Level: 7**

**SAQA ID: 98955**

**Qualification Code: BNCME I**

**Location: Steve Biko Campus (S4 Level 1)**

#### Description of the Programme

The learning programme consists of a coherent assembly of knowledge areas associated with chemical engineering practice, these include mathematics, natural sciences, engineering sciences, design and synthesis, computing and IT, and relevant complementary studies. This assembly of knowledge areas provides a viable platform for further studies and lifelong learning and will produce graduates who can function in today's fast changing, dynamic and evolving industrial marketplace.

The broad training in natural and mathematical sciences, coupled with a strong foundation in chemical engineering principles, will produce graduates that are highly numerate and have skills in problem solving, teamwork, communication, and Information Technology. This qualification is designed to provide the graduate with knowledge and attributes to work in a diverse spectrum of industries including the chemical, petrochemical, pulp and paper, polymer, mining, water and wastewater treatment, energy, food, and pharmaceutical industries. The key attributes of the graduates of this qualification are:

- The ability to apply established and newly developed engineering technology to solve *broadly-defined* problems and develop components, systems, services, and processes.
- The ability to provide leadership in the application of technology in safety, health, engineering, and commercially effective operations and have well-developed interpersonal skills.
- Working independently and responsibly, applying judgement to decisions arising in the application of technology and health and safety considerations to problems and associated risks.
- A specialized understanding of engineering sciences with a deep underlying knowledge of specific technologies together with financial, commercial, legal, social, and economic, health, safety, and environmental matters.

This qualification provides the educational base for registration as a candidate Professional Engineering Technologist with the Engineering Council of South Africa (ECSA) and is recognized internationally through the Sidney Accord.

#### What is Chemical Engineering?

Chemical Engineering is a science that involves the study of processes required for the conversion of raw materials into useful products with minimum environmental impact. It uses the application of physical and life sciences, mathematics, economics, and engineering sciences to produce, transform, and transport chemicals, materials, and energy.

Chemical engineering professionals are involved in the transfer of scientific discoveries into modern manufacturing technologies for the production of chemical and products that benefit society. They are involved in the development and manufacture of consumer products, as well as in design, operation, and control of processes in a variety of industries (e.g., petroleum, petrochemical, chemical, consumer products, food, feed and pharmaceuticals).

Examples of some typical chemical engineering operations in South Africa include:

- The conversion of crude oil into petrol, diesel, wax, etc.
- The conversion of wood into paper products.

- The extraction of sugar from sugarcane
- The conversion of coal into petrol and other useful products.
- The extraction of precious minerals

We make daily use of products that are obtained via the principles of chemical engineering, e.g.: paper, plastic materials, textiles, petrol, fertilizers, drinkable water etc.

### Career Opportunities

A Chemical Engineering Technologist is employed in chemical plants for the purpose of research and development; economic evaluation; chemical engineering design; plant operations and management; project management and product marketing.

### Why do Chemical Engineering at Durban University of Technology?

The mission of the Department of Chemical Engineering is primarily to provide a relevant program, maintain a strong balance between theory and practice, establish and maintain partnerships with industry and excel in research and development with technology transfer through external engagement. Some of the key characteristics of the department are:

- The department is recognised as one of the leading University of Technology departments in Chemical Engineering teaching and research.
- In keeping with the philosophy of vocational training, the department has one of the most comprehensive laboratory facilities in the country.
- It has received full accreditations for all its chemical engineering programmes from the Engineering Council of South Africa.
- The department has qualified chemical engineers with a range of expertise that are responsible for teaching and research. This ensures the maintenance of high standards, a continuous cross flow of ideas, and provides the ideal basis for the transfer of the latest technology to students.
- The Department is actively involved in relevant research. The research areas include water and wastewater treatment; membrane technology; particle technology; beneficiation of waste streams, catalysis, fuels, thermodynamics, and mathematical modelling.

The courses offered are current and relevant because the Department of Chemical Engineering has extensive interaction with the chemical industry, research organisations, The South African Institution of Chemical Engineers, and the Engineering Council of South Africa.

#### Explanation of Points scale:

| SENIOR CERTIFICATE(SC) |              |                |
|------------------------|--------------|----------------|
| SYMBOL                 | HIGHER GRADE | STANDARD GRADE |
| A                      | 8            | 6              |
| B                      | 7            | 5              |
| C                      | 6            | 4              |
| D                      | 5            | 3              |
| E                      | 4            | 2              |
| F                      | 3            | 1              |
| A                      | 8            | 6              |
| B                      | 7            | 5              |

| NATIONAL SENIOR CERTIFICATE(NSC) |       |        |
|----------------------------------|-------|--------|
| %                                | LEVEL | POINTS |
| 90-100                           | 7     | 8      |
| 80-89%                           | 7     | 7      |
| 70-79%                           | 6     | 6      |
| 60-69%                           | 5     | 5      |
| 50-59%                           | 4     | 4      |
| 40-49%                           | 3     | 3      |
| 30-39%                           | 2     | 2      |
| 20-29%                           | 1     | 1      |

## MINIMUM ADMISSION REQUIREMENTS

### GENERAL ADMISSION REQUIREMENTS

A person will only be considered for registration for an instructional programme approved by the Institution's Senate if the person complies with:

- The minimum admission requirements stated in DUT general handbook (refer to DUT website for general handbook).
- Institutional faculty, departmental and/or instructional programme specific rules; and

### MINIMUM ADMISSION REQUIREMENTS IN TERMS OF THE HIGHER EDUCATION QUALIFICATIONS SUB-FRAMEWORK (HEQSF)

#### G7 rule: For Bachelor's Degree:

"a National Senior Certificate (NSC) as certified by the Council for General and Further Education and Training (Umalusi), with a minimum achievement rating of 3 for English and a minimum achievement rating of 4 in four NSC 20-credit subjects chosen from the NSC designated subject list"

#### Entry Requirements BET (Chemical Engineering)

| NATIONAL SENIOR CERTIFICATE (NSC)<br>(01 January 2009)   |                 | SENIOR CERTIFICATE (SC)<br>(PRE 2009)                                   |    |    | NATIONAL CERTIFICATE<br>(VOCATIONAL) (NCV)  |      |
|--|-----------------|---|----|----|---|------|
| <b>NSC DEGREE ENTRY</b>  |                 | <b>SENIOR CERTIFICATE (SC)<br/>With a pass in English or equivalent</b> |    |    | <b>(NCV) LEVEL 4</b>  |      |
| Compulsory Subjects  | NSC Rating Code | Compulsory Subjects   | HG | SG | Compulsory Subjects   | Mark |
| English  | 4               |   |    |    | English   | 60%  |
| Mathematics  | 4               | Mathematics   | C  | B  | Mathematics   | 70%  |
| Physical Science   | 4               | Physical Science  | C  | B  | Physical Science  | 70%  |
| In addition: <b>TWO</b><br>recognized NSC 20 credit<br>subjects as per G7 rule<br>stated above   | 4               |   |    |    |   |      |
| A pass in the subjects Technical Drawing and/or Computer Studies will be an added recommendation.  |                 |   |    |    | Life Orientation  | 60%  |
|  |                 |   |    |    | In addition, <b>TWO</b> other additional vocational subjects at a minimum of 60%. |      |
| <b>NB:</b>   |                 |   |    |    |   |      |
| 1. NSC Mathematical Literacy will not be accepted as a substitute for the subject NSC Mathematics  |                 |   |    |    |   |      |
| 2. The exit certificate of the candidate must qualify the candidate for degree study at an institution of higher learning.   |                 |   |    |    |   |      |
| 3. Applicants with a NSC will be ranked according to the sum of their scores for Mathematics and Physical Science, subject to a minimum combined score of 100%.  |                 |   |    |    |   |      |
| 4. Prospective applicants may also present an NQF level 6 Diploma in Engineering for entry into the degree programme. A possibility of transfer of credits for cognitive previous studies would be considered dependent on the discipline and nature of the Diploma being presented. |                 |   |    |    |   |      |
| 5. Students are ranked on merit in the final selection   |                 |   |    |    |   |      |

**OR**

### Admission Requirement based upon Work Experience, Age and Maturity

#### For admission to entry level DEGREE studies:

A person may, subject to such requirements as the Senate may determine, be admitted if such a person is in possession of a National Senior Certificate, Senior Certificate, or an equivalent certificate, but lacks the minimum requirements for admission to the degree provided that:

- The person shall have reached the age of 23 in the first year of registration and shall have at least:
  - three years' appropriate work experience; and/or
  - capacity for the proposed instructional programme, which shall be assessed by a Senate-approved admission assessment comprising of a DUT Standardised Assessment Test for Access and Placement (SATAP), Academic Literacies (AL) & English for Academic Purposes (EAP) (2,5 hours) and/or an appropriate subject or programme specific written assessment designed and marked by the relevant Department; and the person has obtained
- A conditional certificate of exemption from the Matriculation Board (when in possession of the Senior Certificate (SC)); OR has met
- The requirements for Senate discretionary admission (when in possession of the NSC or equivalent), where Senate is satisfied the applicant has shown sufficient academic ability to ensure success, and that the person's standard of communication skills, and/or work

experience are such that the person, in the opinion of the Senate, should be able to complete the proposed instructional programme successfully.

- (d) The person's application for admission in terms of with work experience, age and maturity is approved prior to registration.

**Applicants intending to gain admission through work experience, age and maturity must submit their applications at least four months before commencement of the academic year.**

## Tuition Fees

To assist you with your planning, the **2023** fees have been indicated. An increase for next year to accommodate the inflation rate can be expected.

**Please Note:** DUT cannot be held liable for the fees in this brochure as the **2024** fees are not yet finalised

### First Year Curriculum

| Name of Module                         | Subject Code | HEQSF Level | SAQA Credits | 2023 Fees        |
|--|--------------|-------------|--------------|------------------|
| <b>Semester One</b>                    |              |             |              |                  |
| Engineering Mathematics IA             | EMTA101      | 5           | 12           | R4440.00         |
| Engineering Chemistry IA               | ENCA101      | 5           | 12           | R5230.00         |
| Cornerstone I01                        | CSTN101      | 5           | 12           | R3580.00         |
| Engineering Physics IA                 | EPHA101      | 5           | 12           | R4400.00         |
| Chemical Engineering Fundamentals IA   | CEFA101      | 5           | 12           | R4400.00         |
| Technical Literacy                     | TCHL101      | 5           | 12           | R3030.00         |
| <b>TOTAL</b>                           |              |             |              | <b>R25080.00</b> |
| <b>Semester Two</b>                    |              |             |              |                  |
| Engineering Mathematics IB             | EMTB101      | 5           | 12           | R4400.00         |
| Engineering Chemistry IB               | ENCB101      | 5           | 12           | R5230.00         |
| Computer Applications IA               | CMAP101      | 5           | 8            | R4400.00         |
| Engineering Physics IB                 | EPHB101      | 5           | 12           | R4400.00         |
| Chemical Engineering Fundamentals IB   | CEFB101      | 5           | 12           | R4400.00         |
| Chemical Engineering Design I          | CEDS101      | 5           | 12           | R4400.00         |
| <b>TOTAL CREDITS SEMESTER 1&amp;2</b>  |              |             | <b>140</b>   |                  |
| <b>TOTAL</b>                           |              |             |              | <b>R27230.00</b> |
| <b>Second Year Curriculum</b>          |              |             |              |                  |
| <b>Semester Three</b>                  |              |             |              |                  |
| Engineering Mathematics IIA            | EMTH201      | 6           | 12           | R4400.00         |
| Engineering Chemistry IIA              | ENCM201      | 6           | 12           | R5230.00         |
| Computer Applications IIA              | CMAP201      | 6           | 12           | R4400.00         |
| Process Fluid Flow                     | PFFL101      |             | 6            | R4400.00         |
| Chemical Engineering Laboratory IA     | CELA101      | 6           | 8            | R4400.00         |
| Chemical Engineering Design IIA        | CEDA201      | 6           | 12           | R4400.00         |
| Principles of Management               | PCPM101      | 6           | 8            | R3030.00         |
| <b>TOTAL</b>                           |              |             |              | <b>R30260.00</b> |
| <b>Semester Four</b>                   |              |             |              |                  |
| Transfer Processes                     | TRFP101      | 6           | 12           | R4400.00         |
| Applied Statistics                     | APPS101      | 6           | 8            | R3030.00         |
| Process Safety and Occupational Health | PSOH101      | 6           | 12           | R4400.00         |
| Applied Thermodynamics                 | APTH101      | 6           | 12           | R4400.00         |
| Chemical Engineering Laboratory IB     | CELB101      | 6           | 8            | R4400.00         |
| Chemical Engineering Design IIB        | CEDB201      | 6           | 12           | R4400.00         |
| <b>TOTAL CREDITS SEMESTER 3&amp;4</b>  |              |             | <b>134</b>   |                  |
| <b>TOTAL</b>                           |              |             |              | <b>R25030.00</b> |
| <b>Third Year Curriculum</b>           |              |             |              |                  |
| <b>Semester Five</b>                   |              |             |              |                  |
| Environmental Engineering              | ENVN101      | 7           | 12           | R4400.00         |
| Chemical Thermodynamics                | CTHM101      | 7           | 12           | R4400.00         |
| Unit Operations                        | UNOP101      | 7           | 12           | R5230.00         |
| Multistage Operations                  | MSOP101      | 7           | 12           | R5230.00         |
| Chemical Engineering Laboratory IIA    | CELA201      | 7           | 8            | R5230.00         |

|                                       |         |   |            |                  |
|---------------------------------------|---------|---|------------|------------------|
| Chemical Engineering Design IIIA      | CEDA301 | 7 | 6          | R5230.00         |
| <b>TOTAL</b>                          |         |   |            | <b>R29720.00</b> |
| <b>Semester Six</b>                   |         |   |            |                  |
| Particle Technology                   | PTCT101 | 7 | 12         | R4400.00         |
| Reaction Engineering                  | RCNE101 | 7 | 12         | R4400.00         |
| Process Control                       | PCSC101 | 7 | 12         | R4400.00         |
| Project Management                    | PMNM101 | 7 | 8          | R3030.00         |
| Chemical Engineering Laboratory IIB   | CELB201 | 7 | 8          | R5230.00         |
| Chemical Engineering Design IIIB      | CEDB301 | 7 | 16         | R5230.00         |
| <b>TOTAL CREDITS SEMESTER 5&amp;6</b> |         |   | <b>130</b> |                  |
| <b>TOTAL</b>                          |         |   |            | <b>R26690.00</b> |

**NB:** The course structure and requisite modules are subject to alteration.

## Application

Applicants who wish to enrol for the programme must apply through the CAO system by no later than 30 September of the previous year.

## Application Forms

Contact the **Central Applications Office (CAO)**

### Address letters to:

Central Applications Office  
Private Bag X06  
Dalbridge,  
4014

Tel: (031) 2684444

Fax: (031) 2684422

### OR

Apply Online: <http://www.cao.za>

**CAO Code:** DU-D-ECH

**Closing date for applications:** 30 September 2023

## For Further Information

Contact the Department of Chemical Engineering

Steve Biko Campus (S4 Level I)

Durban University of Technology

P O Box 1334

DURBAN, 4000

Tel: (031) 3732218

Fax: (031) 3732285

Email: [khanyisilen@dut.ac.za](mailto:khanyisilen@dut.ac.za)

## Financial Aid

For Financial Aid application for a DUT programme please apply online at [www.nsfas.org.za](http://www.nsfas.org.za) or call the NSFAS call centre on 0860 067 327.

For an explanation on how to fill out the application form, please go to [www.nsfas.org.za](http://www.nsfas.org.za) or contact the call centre on the number above.

**Please note** that completing a form does not guarantee Financial Aid. For further assistance, please consult the Department of Financial Aid and Scholarships on (031)373 2931/2557/2054.

*This is for information purposes only and is not binding on the Durban University of Technology*